1MBH75D-060S

Molded IGBT

600V / 75A Molded Package

■ Features

· Small molded package
· Low power loss
· Soft switching with low switching surge and noise
· High reliability, high ruggedness (RBSOA, SCSOA etc.)
· Comprehensive line-up

■ Applications

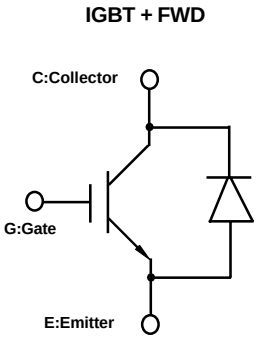
· Inverter for Motor drive
· AC and DC Servo drive amplifier
· Uninterruptible power supply

■ Maximum ratings and characteristics

● **Absolute maximum ratings (Tc=25°C)**

Item			Symbol	Rating	Unit
Collector-Emitter voltage			V_{CES}	600	V
Gate-Emitter voltaga			V_{GES}	±20	V
Collector current	DC	Tc=25°C	I_{C25}	83	A
		Tc=100°C	I_{C100}	75	A
	1ms	Tc=25°C	Icp	225	A
Max. power dissipation (IGBT)			P_C	310	W
Max. power dissipation (FWD)			P_C	180	W
Operating temperature			T_j	+150	°C
Storage temperature			T_{stg}	-40 to +150	°C
Screw torque			-	58.8 to 78.4	N·cm

■ Equivalent Circuit Schematic



● **Electrical characteristics (at Tc=25°C unless otherwise specified)**

Item		Symbol	Characteristics			Conditions	Unit
			Min.	Typ.	Max.		
Zero gate voltage collector current		I_{CES}	–	–	1.0	V_{GE}=0V, V_{CE}=600V	mA
Gate-Emitter leakage current		I_{GES}	–	–	10	V_{CE}=0V, V_{GE}=±20V	μA
Gate-Emitter threshold voltage		$V_{GE(th)}$	4.0	5.0	6.0	V_{CE}=20V, I_C=75mA	V
Collector-Emitter saturation voltage		$V_{CE(sat)}$	–	2.4	2.9	V_{GE}=15V, I_C=75A	V
Input capacitance		C_{ies}	–	3700	–	V_{GE}=0V	pF
Output capacitance		C_{oes}	–	350	–	V_{CE}=25V	
Reverse transfer capacitance		C_{res}	–	190	–	f=1MHz	
Switching Time	Turn-on time	t_{on}*	–	0.15	–	V_{CC}=300V, I_C=75A	μs
		t_r*	–	0.09	–	V_{GE}=±15V	
		t_{rr2}	–	0.03	–	R_G=24 ohm	
	Turn-off time	t_{off}	–	0.50	0.62	(Half Bridge)	
		t_f	–	0.10	0.17	Inductance Load	
	Turn-on time	t_{on}*	–	0.15	–	V_{CC}=300V, I_C=75A	μs
		t_r*	–	0.09	–	V_{GE}=+15V	
		t_{rr2}	–	0.03	–	R_G=6 ohm	
	Turn-off time	t_{off}	–	0.50	0.62	(Half Bridge)	
		t_f	–	0.10	0.17	Inductance Load	
FWD forward on voltage		V_F	–	2.0	2.5	I_F=75A, V_{GE}=0V	V
Reverse recovery time		t_{rr}	–	0.06	0.10	I_F=75A, V_{GE}=-10V, V_R=300V, di/dt=100A/μs	μs

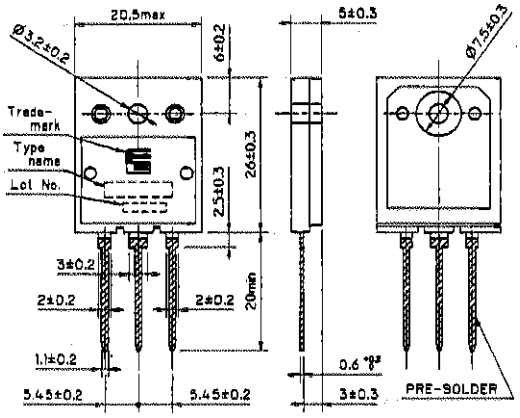
*Turn-on characteristics include trr2. See a figure in next page.

● **Thermal resistance characteristics**

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	Rth(j-c)	–	–	0.40	IGBT	°C/W
	Rth(j-c)	–	–	0.69	FWD	°C/W

■ Outline drawings, mm

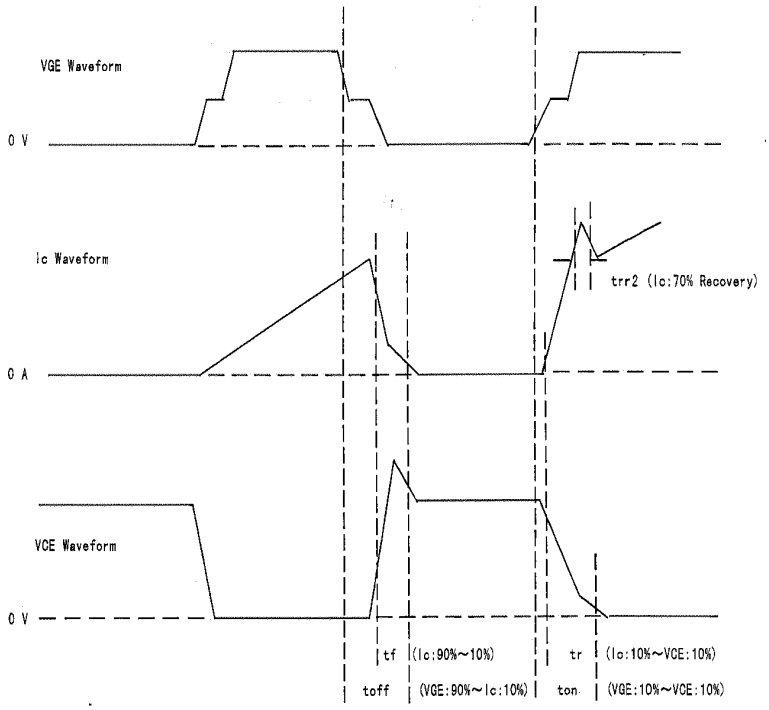
TO-3PL



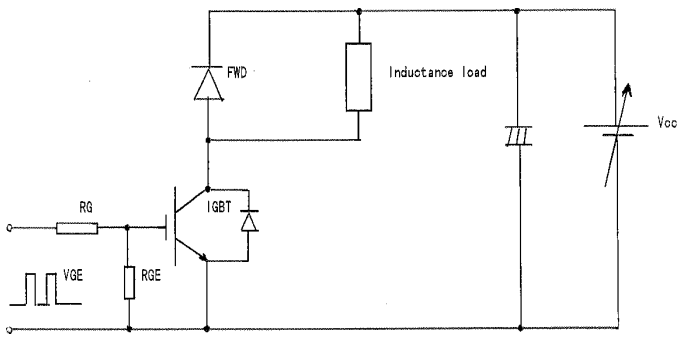
CONNECTION

① Gate
② Collector
③ Emitter

■ Switching waveform (Inductance load)

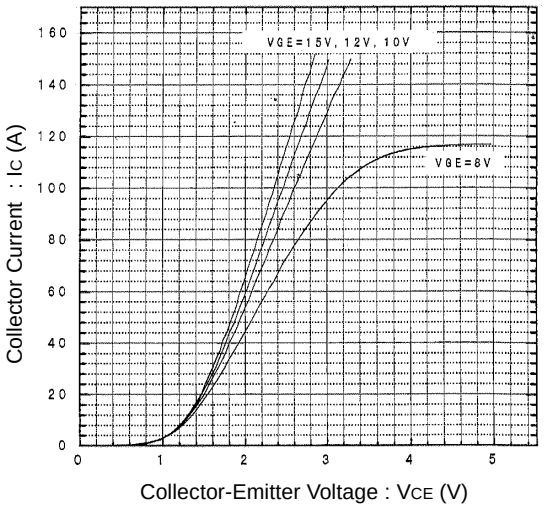


■ Mesurement circuit

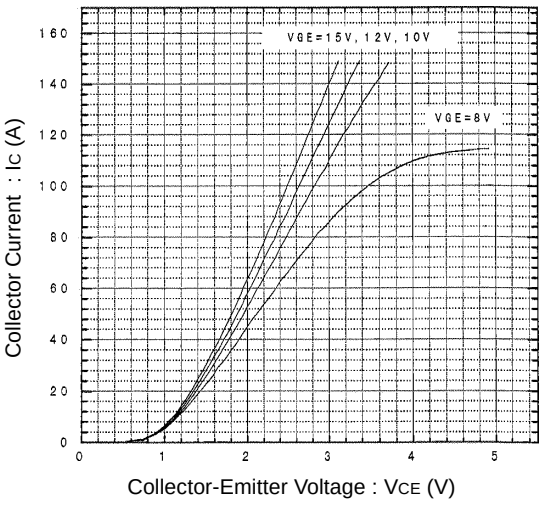


■ Characteristics

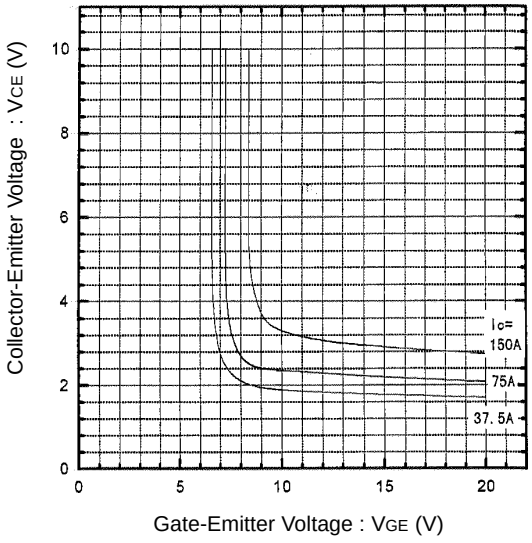
Collector current vs. Collector-Emitter voltage
Tj=25°C



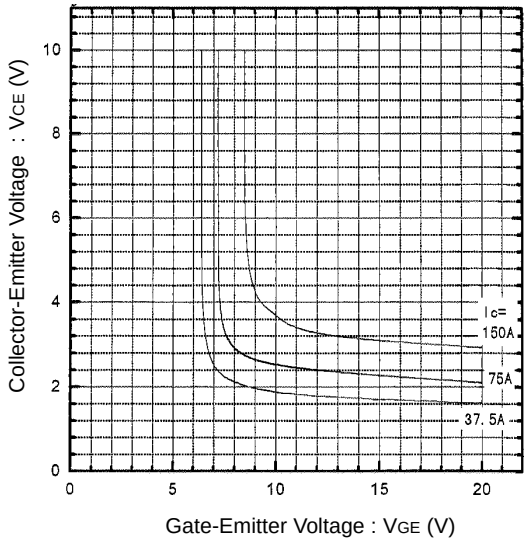
Collector current vs. Collector-Emitter voltage
Tj=125°C



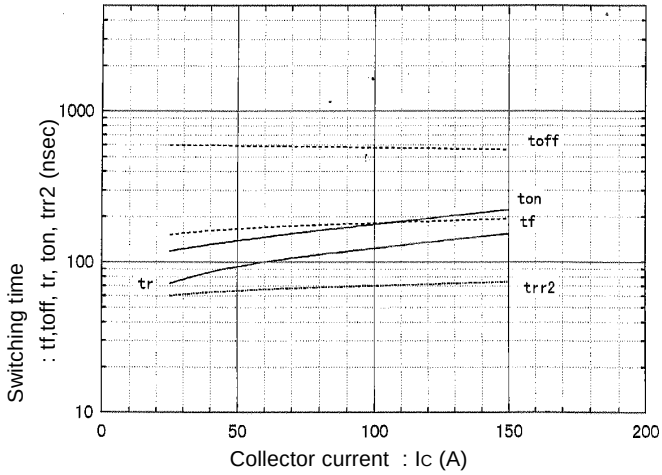
Collector-Emitter voltage vs. Gate-Emitter voltage
Tj=25°C



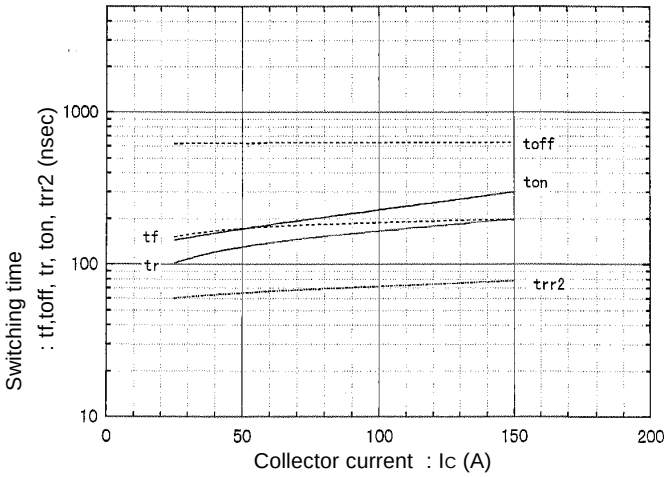
Collector-Emitter voltage vs. Gate-Emitter voltage
Tj=125°C



Switching time vs. Collector current
VCC=300V, RG=6Ω, VGE=+15V, Tj=125°C

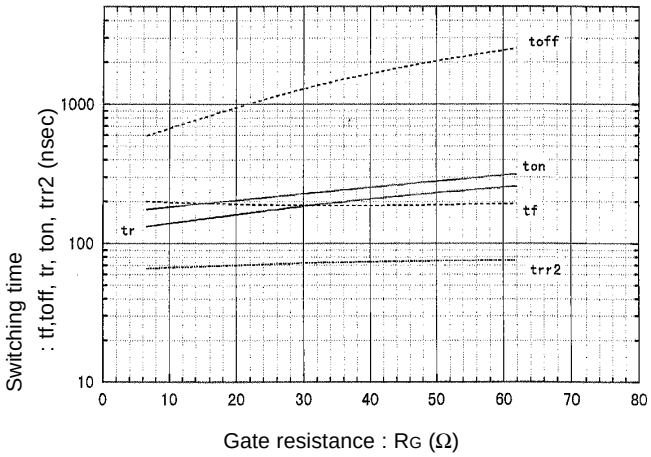


Switching time vs. Collector current
VCC=300V, RG=24Ω, VGE=±15V, Tj=125°C

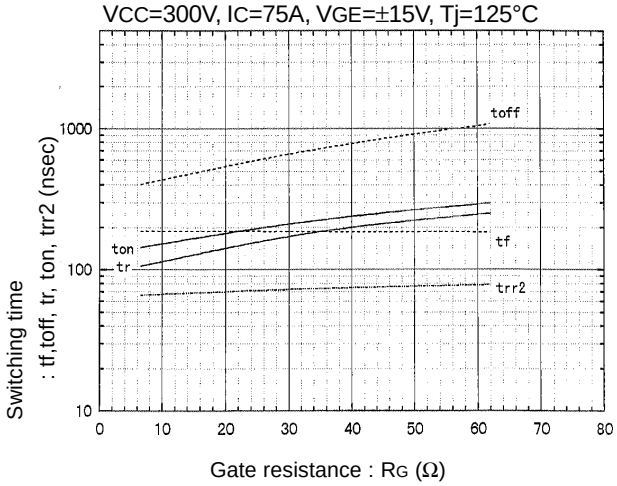


■ Characteristics

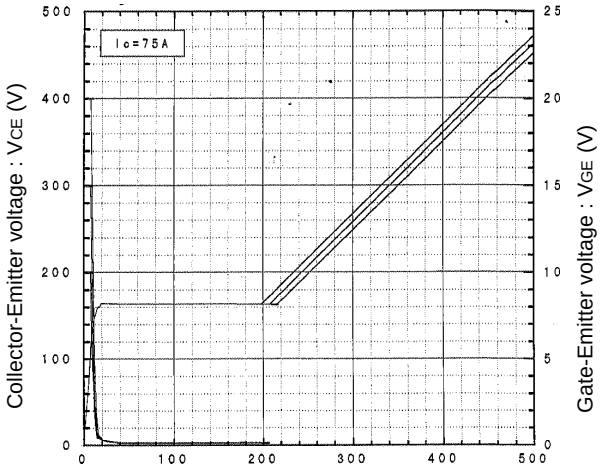
Switching time vs. RG
VCC=300V, IC=75A, VGE=+15V, Tj=125°C



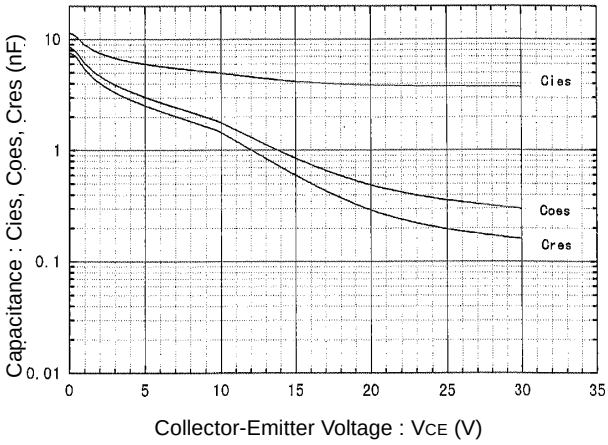
Switching time vs. RG
VCC=300V, IC=75A, VGE=±15V, Tj=125°C



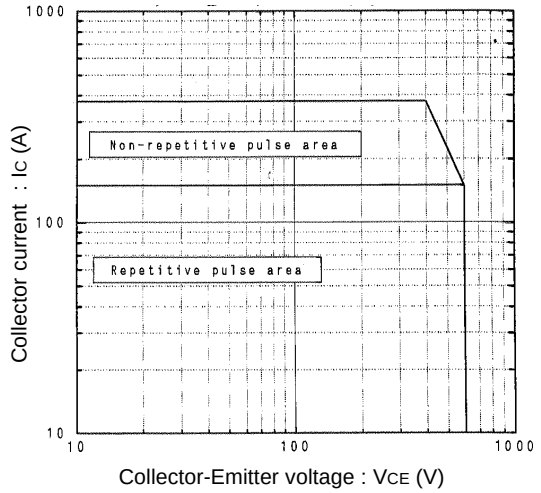
Dynamic input characteristics
Tj=25°C



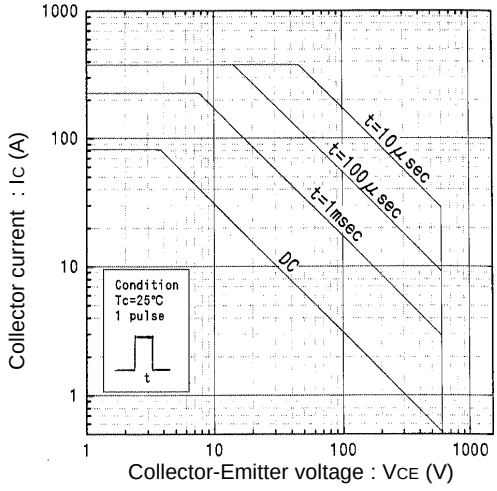
Capacitance vs. Collector-Emitter voltage
Tj=25°C



Reverse Biased Safe Operating Area
RG=6Ω, +VGE≦20V, -VGE=15V, Tj≦125°C

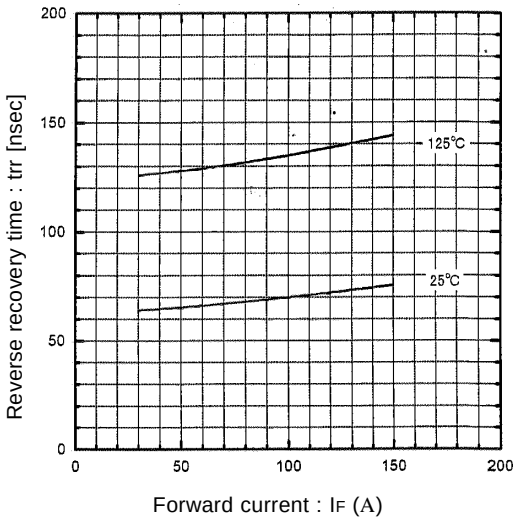


Forward Bias Safe Operating Area

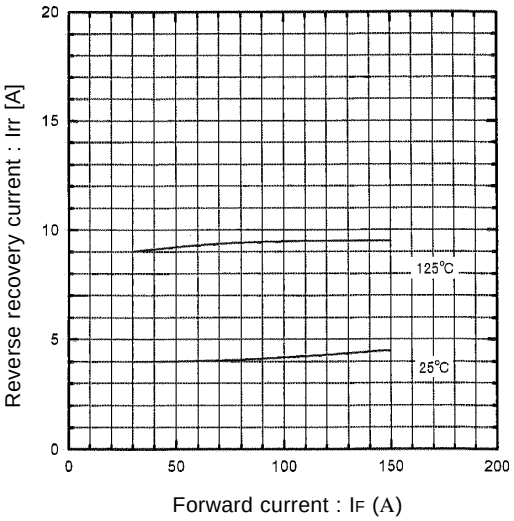


■ Characteristics

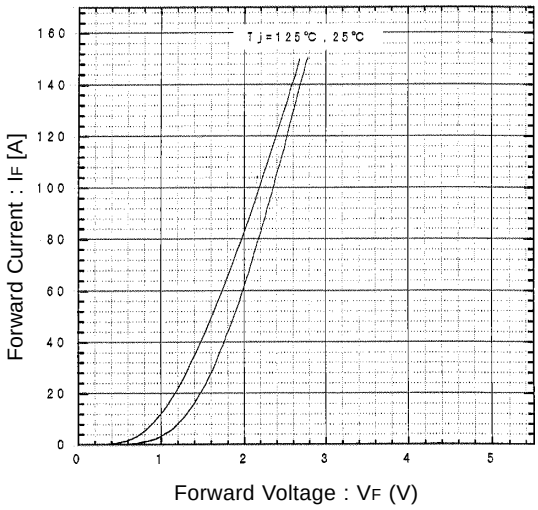
Reverse recovery time vs. Forward current
VR=300V, -di/dt=100A/µsec



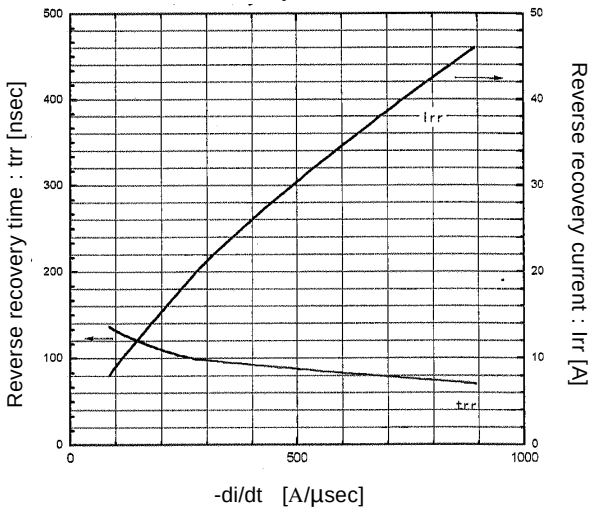
Reverse recovery current vs. Forward current
VR=300V, -di/dt=100A/µsec



Forward voltage vs. Forward current



Reverse recovery chracteristics vs. -di/dt
VR=300V, IF=75A, Tj=125°C



Transient thermal resistance